

CLAIMS

1. A method for forming an electromagnetic transducer, the method comprising:

forming a first soft magnetic pole layer having a substantially flat surface;

forming an inorganic nonferromagnetic layer over said first pole layer, including forming an inorganic nonferromagnetic apex region having a side that is not parallel and not perpendicular to said surface;

forming a second soft magnetic pole layer over said inorganic nonferromagnetic apex region.

2. The method of claim 1, further comprising:

forming a hardbaked photoresist mask over said inorganic nonferromagnetic layer;

wherein forming said inorganic nonferromagnetic apex includes etching said hardbaked photoresist mask and said inorganic nonferromagnetic layer to create said inorganic nonferromagnetic apex region.

3. The method of claim 1, further comprising:

forming a photoresist mask over said inorganic nonferromagnetic layer, said mask terminating adjacent to a desired location of said side;

wherein forming said inorganic nonferromagnetic apex region includes:

depositing said inorganic nonferromagnetic layer on said first soft magnetic pole layer and said photoresist mask; and

chemically removing said photoresist mask.

4. The method of claim 1, further comprising:

forming a photoresist mask over said inorganic nonferromagnetic layer, said mask terminating adjacent to a desired location of said side;

wherein forming said inorganic nonferromagnetic apex region includes:

chemically etching said inorganic nonferromagnetic layer.

5. The method of claim 1, further comprising:

forming an inorganic dielectric layer adjacent to said inorganic nonferromagnetic apex region; and

forming an electrically conductive coil layer atop said inorganic dielectric layer.

6. The method of claim 1, further comprising:

forming a submicron inorganic nonferromagnetic layer adjacent to said region of inorganic nonferromagnetic material;

wherein forming said second soft magnetic pole layer over said inorganic nonferromagnetic apex region includes forming said second soft magnetic layer over said submicron inorganic nonferromagnetic layer.

7. The method of claim 1, further comprising:

forming an inorganic dielectric layer that partly covers said first soft magnetic pole layer, prior to forming said inorganic nonferromagnetic apex region; and

positioning said inorganic nonferromagnetic apex region partly over said first soft magnetic pole layer and partly over said inorganic dielectric layer.

8. A method for forming an electromagnetic transducer,  
the method comprising:  
forming a first soft magnetic layer having a  
substantially flat surface;  
forming an inorganic nonferromagnetic layer over  
said soft magnetic pole layer;  
forming a photoresist mask atop said inorganic  
nonferromagnetic layer;  
curing said photoresist mask to form a hardbaked  
photoresist mask;  
etching said hardbaked photoresist mask and said  
inorganic nonferromagnetic layer,  
including removing said hardbaked photoresist  
mask, and  
thereby forming a region of inorganic  
nonferromagnetic material over said first soft magnetic  
layer.

9. The method of claim 8, wherein:  
forming said region of inorganic nonferromagnetic  
material includes forming a side of said region that is not  
parallel and not perpendicular to said surface.

10. The method of claim 8, wherein:  
forming said region of inorganic nonferromagnetic  
material includes etching said inorganic nonferromagnetic  
layer into a shape that substantially duplicates a shape of  
said mask.

11. The method of claim 8, further comprising:  
forming a second soft magnetic layer over said  
region of inorganic nonferromagnetic material.

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12. The method of claim 8, further comprising:  
forming an inorganic dielectric layer adjacent to  
said region of inorganic nonferromagnetic material; and  
forming an electrically conductive coil layer  
atop said inorganic dielectric layer.

13. The method of claim 8, further comprising:  
forming a submicron inorganic nonferromagnetic  
layer adjacent to said region of inorganic nonferromagnetic  
material; and  
forming a second soft magnetic layer over said  
region of inorganic nonferromagnetic material and said  
submicron inorganic nonferromagnetic layer.

14. The method of claim 8, further comprising:  
forming an inorganic dielectric layer that partly  
covers said first soft magnetic layer, prior to forming  
said inorganic nonferromagnetic layer;  
positioning said mask such that said region of  
inorganic nonferromagnetic material is disposed partly on  
said first soft magnetic layer and partly on said inorganic  
dielectric layer.

15. A method for forming an electromagnetic transducer,  
the method comprising:  
a step for forming a first soft magnetic pole  
layer having a substantially flat surface;  
a step for forming an inorganic nonferromagnetic  
apex region over said first soft magnetic pole layer to  
have a sloping surface;  
a step for forming a second soft magnetic pole  
layer over said inorganic nonferromagnetic apex region.

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16. The method of claim 15, wherein said step for forming said inorganic nonferromagnetic apex region further comprises:

- forming an inorganic nonferromagnetic layer;
- forming a hardbaked photoresist mask over said inorganic nonferromagnetic layer; and
- etching said hardbaked photoresist mask and said inorganic nonferromagnetic layer to create said inorganic nonferromagnetic apex region.

17. The method of claim 15, wherein said step for forming said inorganic nonferromagnetic apex region further comprises:

- forming an inorganic nonferromagnetic layer;
- forming a photoresist mask over said inorganic nonferromagnetic layer, said mask terminating adjacent to a desired location of said sloping surface;
- depositing an inorganic nonferromagnetic layer including said inorganic nonferromagnetic layer apex region on said first soft magnetic pole layer and said photoresist mask; and
- chemically removing said photoresist mask.

18. The method of claim 15, wherein said step for forming said inorganic nonferromagnetic apex region further comprises:

- forming an inorganic nonferromagnetic layer,
- forming a photoresist mask over said inorganic nonferromagnetic layer, said mask terminating adjacent to a desired location of said sloping surface;
- chemically etching said inorganic nonferromagnetic layer.

19. The method of claim 15, further comprising:

forming an inorganic dielectric layer that partly covers said first soft magnetic pole layer, prior to forming said inorganic nonferromagnetic apex region; and

positioning said inorganic nonferromagnetic apex region partly over said first soft magnetic pole layer and partly over said inorganic dielectric layer.

20. The method of claim 15, further comprising:

forming a submicron inorganic nonferromagnetic layer adjacent to said inorganic nonferromagnetic apex region;

wherein forming said second soft magnetic pole layer over said inorganic nonferromagnetic apex region includes forming said second soft magnetic layer over said submicron inorganic nonferromagnetic layer.

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